

## SECTION 05120

### STRUCTURAL STEEL

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**This specification section is for use with shop welded and field bolted connections as recommended in the Structural Standards Manual. If field welds are to be used, specify the inspection procedures to be used in accordance with the performance category of the structure.**  
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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Structural steel.
- B. Shop applied finishes and field applied touchup.
- C. Grout under base plates.

##### 1.2 SUBMITTALS

- A. Submit the following in accordance with the requirements of Sections 01300:
  - 1. Certifications:
    - a. Provide certificate of compliance for structural steel and high strength load indicator bolts.
    - b. Provide Welders Certification for all welders in accordance with AWS D1.1.
  - 2. Shop Drawings:
    - a. Provide shop drawings in accordance with the AISC Code of Standard Practice and the AISC Structural Steel Detailing Manual.
    - b. Do not fabricate structural steel until shop drawings have been approved by the Contract Administrator.

##### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle structural steel:
  - 1. With equipment of adequate capacity.
  - 2. Without overstressing or permanently deflecting material.
  - 3. Without damaging finish.
- B. Deliver manufactured materials in original unopened packages, containers, or bundles with manufacturer's label intact and legible.
- C. Store materials off ground, under cover, and away from damp surfaces.
- D. Remove damaged, unlabeled or unsatisfactory materials which do not meet this specification from the job site.

## PART 2 PRODUCTS

### 2.1 MATERIALS

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#### **Structural engineer will specify materials.**

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- A. Provide structural steel conforming to ASTM [A36].
- B. Provide steel pipe conforming to ASTM [A53, Type E or S, Grade B].
- C. Provide steel tube conforming to ASTM [A500, Grade B].
- D. Provide high strength, load indicator bolts and nuts conforming to ASTM [A325].
- E. Provide anchor bolts and tie rod materials conforming to ASTM [A307].
- F. Provide primer for exterior application conforming to FS [TT-P-31, Paint Iron Oxide, Ready Mixed, Red].
- G. Provide primer for interior applications conforming to [SSPC Paint 13, Red, One Coat Shop Paint].
- H. Provide welding electrodes conforming to AWS D1.1, Table 4.1.1, [E70XX, low hydrogen].
- I. Provide undercut type concrete anchors as manufactured by Drillco Devices, Ltd. Type Maxi-Bolt or approved equal.
- J. Provide Headed Steel Anchors (HSA) as manufactured by TRW Nelson Division type [H4L] or approved equal.
- K. Provide shear stud connectors conforming to ASTM A108, grade 1015 forged steel, headed, uncoated, size as shown on Drawings.
- L. Provide grout conforming to the following:  
  
Non-shrink type, pre-mixed compound consisting of non-metallic aggregates, cement, water reducing, and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.

### 2.2 FABRICATION

- A. Fabricate structural steel in accordance with:
  - 1. AISC Specifications, as applicable.
  - 2. AISC Code of Standard Practice for Steel Buildings and Bridges.
  - 3. Approved shop drawings.
- B. Workmanship
  - 1. Provide finished members:
    - a. Straight or true to required lines and curvatures.
    - b. Free of twists, buckles and bends.

- 2. Provide bolt holes:
  - a. Accurately spaced to required centers.
  - b. Punched, drilled or sub-drilled and reamed.
- C. Welding
  - 1. Conform to AWS D1.1 and the AISC Specification.
  - 2. Provide run-off tabs for groove welds.
  - 3. Clean welds by removing all slag, flux and spatter prior to finishing.
  - 4. Certify welder in accordance with AWS D1.1.

## 2.3 FINISHING

- A. Shop Prime
  - 1. Perform finishing work in accordance with:
    - a. AISC Specifications, as applicable.
    - b. Steel Structures Painting Council.
  - 2. Prepare surfaces in accordance with SSPC-SP2 "Hand Tool Cleaning" or SSPC-SP3, "Power Tool Cleaning."
  - 3. Paint in accordance with the requirements of SSPC-PA1, "Shop, Field, and Maintenance Painting." Apply one coat of specified primer, minimum.
  - 4. Provide 1.5 mils thick paint system of specified primer, measured in accordance with SSPC-PA2.
- B. Galvanized
  - 1. Galvanize structural steel members to ASTM A123.
- C. Do not prime surfaces that will be in contact with concrete, field welded, and bolted with high strength bolts.

## PART 3 EXECUTION

### 3.1 ERECTION

- A. General
  - 1. Erect structure in accordance with the AISC Code of Standard Practice.
  - 2. Erect structure plumb, square, straight and true prior to finishing all connections. Keep tolerances within those stated in the AISC Code of Standard Practice.
  - 3. Use temporary guys and/or tie rods to plumb and square structure.
  - 4. Temporarily bolt or clamp all field connections while adjusting structure and making permanent connections.

B. Bolting

1. Do not correct mismatched holes by reaming without the approval of the Contract Administrator.
2. Do not drift or burn holes.
3. Set anchor bolts with templates.
4. Set anchor bolts to the tolerances specified by AISC Code of Standard Practice for Steel Buildings and Bridges.
5. Make steel to steel bolted connections with specified high strength load indicator bolts.
6. Use beveled washer when the slope of surfaces exceeds 1:20.
7. Install hardened steel washers in accordance with the requirements of the AISC: Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts.
8. Install load indicator bolts in accordance with the directions of the manufacturer.

C. Welding: Refer to "Fabrication" in Part 2.

3.2 GROUTING

- A. Fill void between steel and concrete with grout.
- B. Install grout in conformance with manufacturer's instructions.
- C. Press edges of grout to a 1 to 1 slope.
- D. Cure grout for 7 days according to the Manufacturer's recommendations.

3.3 TOUCH-UP OF FINISHES

- A. Repair after erection, areas where finish has been abraded, damaged, or burned and all field welds, bolts, nuts, and washers.
- B. Apply touch-up paint in accordance with Specification SSPC-PA1, Section entitled "Field Painting."

END OF SECTION